

SUPER●[®]

SUPER●[®]X6DH8-G2
SUPER●[®]X6DHE-G2

USER'S MANUAL

Revision 1.0c

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Preface

About This Manual

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the **SUPER**® X6DH8-G2/X6DHE-G2 motherboard. The **SUPER**® X6DH8-G2/X6DHE-G2 supports single or dual Intel® Nocona™ processors at a 800 MHz front side bus. Based upon Intel's NetBurst microarchitecture, the Nocona processor supports the IA-32 software and includes features found in the Xeon™ processor such as Hyper Pipelined Technology, which includes a multi-stage pipeline, allowing the processor to operate at much higher core frequencies. Packaged in a 604-pin Flip Chip Micro Pin Grid Array(FC-mPGA4) platform in a Zero Insertion Force(ZIF) socket (mPGA 604), the Nocona Processor, which supports Hyper-Threading Technology and Intel EM64T, is ideal for high performance workstation and server environments with up to two processors on one system bus. Please refer to the motherboard specifications pages on our web site (http://www.supermicro.com/Product_page/product-m.htm) for updates on supported processors. This product is intended to be professionally installed.

Manual Organization

Chapter 1 begins with a checklist of what should be included in your mainboard box, describes the features, specifications and performance of the motherboard and provides detailed information about the chipset.

Chapter 2 begins with instructions on handling static-sensitive devices. Read this chapter when you want to install the processor and DIMM memory modules and when mounting the mainboard in the chassis. Also refer to this chapter to connect the floppy and hard disk drives, SCSI drives, the IDE interfaces, the parallel and serial ports, the keyboard and mouse, the power supply and various control panel buttons and indicators.

If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for the video, the memory and the setup configuration stored in CMOS. For quick reference, a general FAQ [Frequently Asked Questions] section is provided.

Chapter 4 includes an introduction to BIOS and provides detailed information on running the CMOS Setup utility.

Appendix A provides BIOS POST codes.

Appendix B provides software and the OS installation instructions.

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Chapter 1

Introduction

1-1 Overview

Checklist

Congratulations on purchasing your computer motherboard from an acknowledged leader in the industry. Supermicro boards are designed with the utmost attention to detail to provide you with the highest standards in quality and performance. Check that the following items have all been included with your motherboard. If anything listed here is damaged or missing, contact your retailer. All are included in the Retail Box.

One (1) Supermicro Mainboard

One (1) ribbon cable for IDE devices

One (1) floppy ribbon cable

One (1) Ultra 320 SCSI cable (*X6DH8-G2 only)

One (1) COM2 cable

One (1) USB (2-port) cable

One (1) SATA cable

One (1) I/O backpanel shield

One (1) Supermicro CD containing drivers and utilities

One (1) User's/BIOS Manual

One (1) Ultra 320 SCSI User's Manual (*X6DH8-G2 only)

Contacting Supermicro

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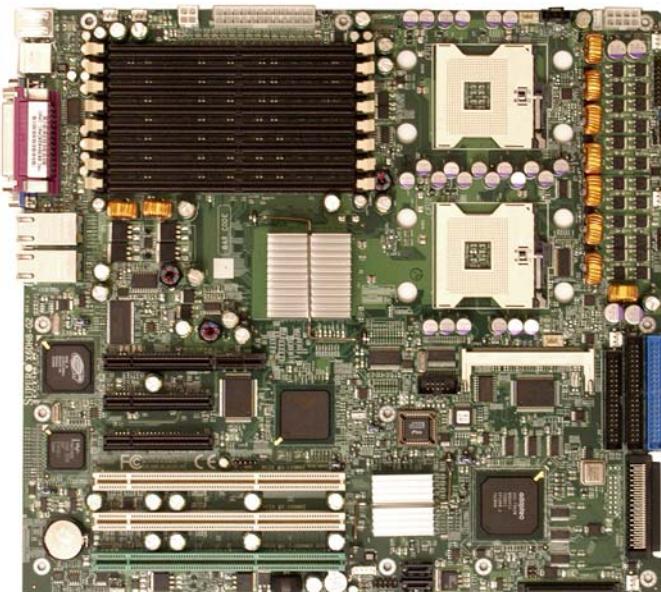
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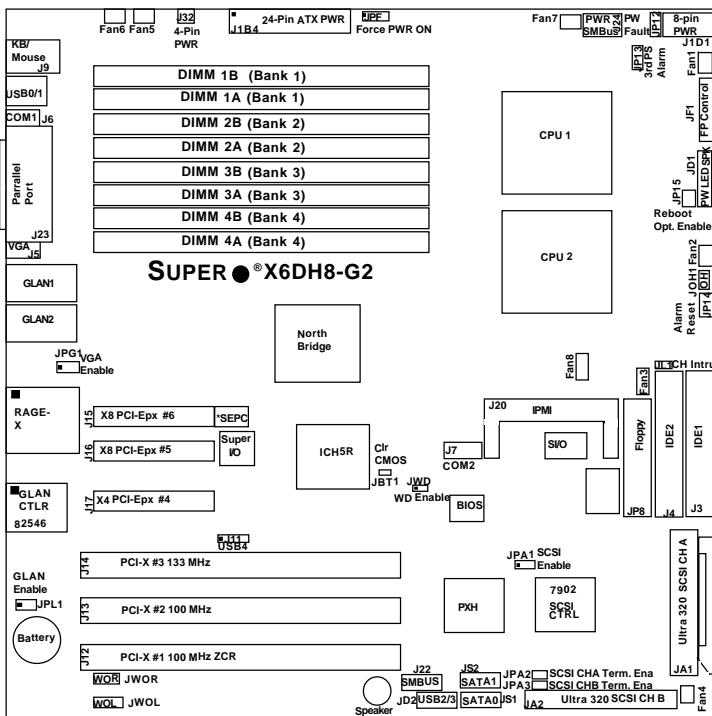
Figure 1-1. **SUPER**® X6DH8-G2/X6DHE-G2 Image



(*Note: The drawings and pictures shown in this manual were based on the latest PCB Revision available at the time of publishing of the manual. The motherboard you've received may or may not look exactly the same as the graphics shown in the manual.)

Figure 1-2. **SUPER** X6DH8-G2/X6DHE-G2 Motherboard Layout

(not drawn to scale)



1. Jumpers not indicated are for test purposes only.
2. See Chapter 2 for detailed information on jumpers, I/O ports and JF1 front panel connections.
3. "■" indicates the location of Pin 1.
- 4. SCSI is for the X6DH8-G2 only**
- 5. SEPC: Supermicro Enhanced Power Connector, specially designed to support Supermicro 2U Riser Card only.**

Quick Reference (X6DH8-G2/X6DHE-G2)

(*Please refer to Chapter 2 for pin definitions and detailed information.)

<u>Jumper</u>	<u>Description</u>	<u>Default Setting</u>
JB1	CMOS Clear	See Chapter 2
JP12	PWR Fault	See Chapter 2
JP13	3rd PW Supply Fail Alarm Enable	Off (Disabled)
JP14	Alarm Reset	Off (Disabled)
JPA1	SCSI Controller Enable	Pins 1-2 (Enabled)*Note
JPA2, JPA3	SCSI CHA(JPA2),CHB(JPA3)Term.En	Off (Enabled)(*Note)
JPF	Force PWR On	Off (Normal)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JPL1	GLAN Enable/Disable	Pins 1-2 (Enabled)
JWD	Watch Dog	Pins 1-2 (Reset)
<u>Connector</u>	<u>Description</u>	
ATX PWR (J1B4)	Primary ATX PWR Connector	
Aux. PWR (J32)	+12V 4-pin Auxiliary System PWR (*Required)	
CPU PWR(J1D1)	+12 V 8-pin CPU PWR Connector (*Required)	
COM1 (J6)/COM2 (J7)	COM1/COM2 Serial Port Connectors	
FAN 1-8	Fans 1-8 (3-pin: Fans 1-4, 4-pin: Fans 5-8)	
DIMM#1A-DIMM#4B	Memory DDRII Slots	
GLAN 1/2 (JLAN1/2)	G-bit Ethernet Ports	
J3/J4	IDE1/2 Hard Disk Drive Connectors	
J5	VGA Connector	
J20	IPMI Connector	
J22	System Management Bus Header	
J23	Parallel (Printer) Port	
J24	Power System Management Header	
JA1/JA2	SCSI Channel A/Channel B Connectors(*Note)	
JD1	PWR LED(pins1-3)/SpeakerHeader (pins 4-7)	
JF1	Front Control Panel Connector	
JL1	Chassis Intrusion Header	
JOH	Overheat LED	
JP8	Floppy Disk Drive Connector	
JS1/JS2	Intel SATA 0/1 Connectors	
JWOL	Wake-on-LAN Header	
JWOR	Wake-on-Ring Header	
USB 0/1	Back Panel USB Ports	
USB 2/3/4	Front Panel Universal Serial Bus Headers(USB2/3:JD2, USB4:J11)	

(*Note: for X6DH8-G2 only)

Motherboard Features

CPU

- Single or dual Intel® 604-pin Nocona™ (w/64-bit extension) processors at 800 MHz front side (system) bus speed.

Memory

- Eight 240-pin DIMM sockets supporting up to 16 GB Registered ECC DDR2-400 (PC3200) Memory

Chipset

- Intel E7520 Lindenhurst chipset

Expansion Slots

- X6DH8-G2/X6DHE-G2

Three PCI-E slots (*two slots at x8@4GB/sec, one slot x4@2GB sec)

Three 64-bit PCI-X slots (*One PCI-X-133 slot, two PCI-X-100 slots)

BIOS

- 8 Mb Phoenix® Flash ROM
- DMI 2.1, PCI 2.2, ACPI 1.0, Plug and Play (PnP), SMBIOS 2.3

PC Health Monitoring

- Onboard voltage monitors for CPU cores, chipset voltage, 3.3V, +5V, +12V and 3.3V standby
- Fan status monitor with firmware/software on/off control
- CPU/chassis temperature monitors
- Environmental temperature monitor and control
- CPU slow-down on temperature overheat
- CPU thermal trip support for processor protection, +5V standby alert LED
- Power-up mode control for recovery from AC power loss
- Auto-switching voltage regulator for CPU core
- System overheat LED and control
- Chassis intrusion detection
- System resource alert

ACPI Features

- Microsoft OnNow
- Slow blinking LED for suspend state indicator
- Main switch override mechanism

Onboard I/O

- Support Adaptec 7902 dual channel Ultra 320 SCSI (*X6DH8-G2 only)
- One IPMI 2.0 socket
- Intel 8254x Gigabit Ethernet controller (PCI-X-133)
- 2 EIDE Ultra DMA/100 bus master interfaces
- 2 SATA ports (w/RAID0, RAID1, JBOD support)
- 1 floppy port interface
- 2 serial ports
- 1 EPP/ECP Parallel Port
- PS/2 mouse and PS/2 keyboard ports
- Up to 5 USB 2.0 (Universal Serial Bus) (2 ports, 3 Headers)
- Super I/O

Other

- Internal/external modem ring-on
- Wake-on-LAN (WOL)
- Console redirection
- Onboard Fan Speed Control by Thermal Management via BIOS

CD/Diskette Utilities

- BIOS flash upgrade utility and device drivers

Dimensions

- ATX Ext. 12" x 13.05" (304.8 x 331.5 mm)

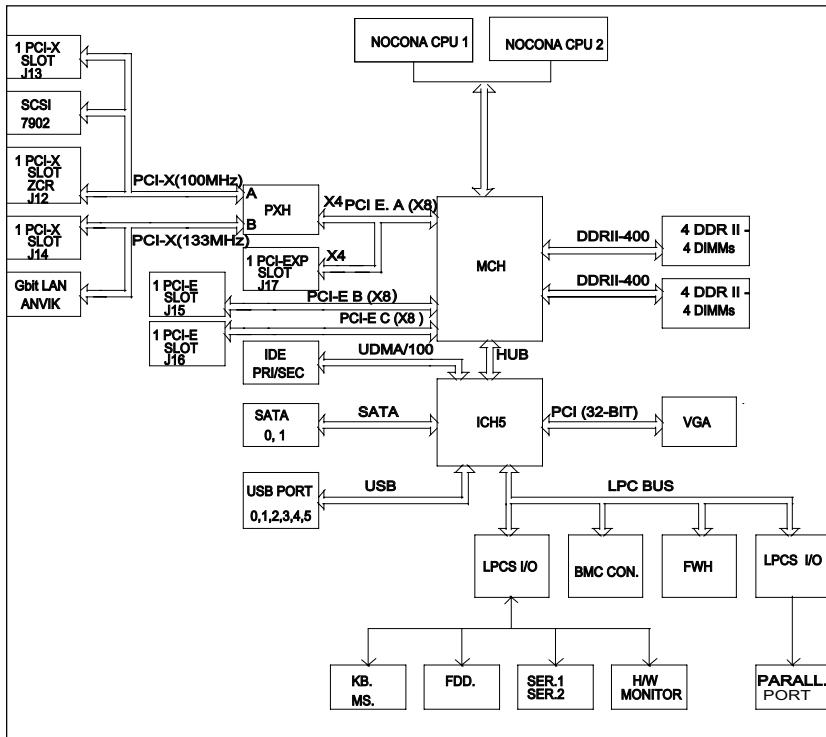


Figure 1-9. Block Diagram of the E7520 Lindenhurst Chipset

Note: This is a general block diagram. Please see the previous Motherboard Features pages for details on the features of each motherboard.

1-2 Chipset Overview

Built upon the functionality and the capability of the E7520 Lindenhurst chipset, The X6DH8-G2/X6DHE-G2 motherboard provides the performance and feature set required for dual processor-based servers, with configuration options optimized for communications, presentation, storage, computation or database applications. The Intel E7520 Lindenhurst chipset consists of the following components: the Lindenhurst Memory Controller Hub (MCH), the 82801ER I/O Controller Hub 5-R (ICH5-R), and the Intel PCI-X Hub.

The E7520 Lindenhurst MCH supports single or dual Nocona processors with Front Side Bus speeds of up to 800 MHz(*Note). Its memory controller provides direct connection to two channels of registered DDR2- 400 with a marched system bus address and data bandwidths of up to 6.4GB/s. The Lindenhurst also supports the new PCI Express high speed serial I/O interface for superior I/O bandwidth. The MCH provides three configurable x8 PCI Express interfaces which may alternatively be configured as two independent x4 PCI Express interfaces. These interfaces support connection of the MCH to a variety of other bridges that are compliant with the PCI Express Interface Specification, Rev. 1.0a. The MCH interfaces with the 82801ER I/O Controller Hub 5-R (ICH5R) via a dedicated Hub Interface supporting a peak bandwidth of 266 MB/s using a x4 base clock of 66 MHz. The PXH provide connection between a PCI Express interface and two independent PCI bus interfaces that can be configured for standard PCI 2.3 protocol, as well as the enhanced high-frequency PCI-X protocol. The PXH can be configured to support for 32- or 64-bit PCI devices running at 33 MHz, 66 MHz, 100 MHz, and 133 MHz.

The ICH5R I/O Controller Hub provides legacy support similar to that of previous ICH-family devices, but with extensions in RAID 0,1 support, Serial ATA Technology, and an integrated ASF Controller. In addition, the ICH5R also provides various integrated functions, including a two-channel Ultra ATA/100 bus master IDE controller, USB 2.0 host controllers, an integrated 10/100 LAN controller, an LPC firmware hub (FWH) and Super IO interface, a System Management Interface, a power management interface, integrated IOxAPIC and 8259 interrupt controllers.

1-3 Special Features

Recovery from AC Power Loss

BIOS provides a setting for you to determine how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must hit the power switch to turn it back on) or for it to automatically return to a power-on state. See the Power Lost Control setting in the Advanced BIOS Setup section (Peripheral Device Configuration) to change this setting. The default setting is Always On.

1-4 PC Health Monitoring

This section describes the PC health monitoring features of the X6DH8-G2/X6DHE-G2. All have an onboard System Hardware Monitor chip that supports PC health monitoring.

Onboard Voltage Monitors for the CPU Cores, Chipset Voltage, +3.3V, +5V, +12V and +3.3V Standby

An onboard voltage monitor will scan these voltages continuously. Once a voltage becomes unstable, a warning is given or an error message is sent to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Fan Status Monitor with Firmware Control

The PC health monitor can check the RPM status of the cooling fans. The onboard CPU and chassis fans are controlled by Thermal Management via BIOS (under Hardware Monitoring in the Advanced Setting).

Environmental Temperature Control

The thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a user-defined threshold. The overheat circuitry runs independently from the CPU. Once it detects that the CPU temperature is too high, it will automatically turn on the thermal fan control to prevent any overheat damage to the CPU. The onboard chassis thermal circuitry can monitor the overall system temperature and alert users when the chassis temperature is too high.

CPU Fan Auto-Off in Sleep Mode

The CPU fan activates when the power is turned on. It continues to operate when the system enters Standby mode. When in sleep mode, the CPU will not run at full power, thereby generating less heat.

CPU Overheat LED and Control

This feature is available when the user enables the CPU overheat warning function in the BIOS. This allows the user to define an overheat temperature. When this temperature is exceeded, both the overheat fan and the warning LED are triggered.

System Resource Alert

This feature is available when used with Supero Doctor III in the Windows OS environment or used with Supero Doctor II in Linux. SDIII is used to notify the user of certain system events. For example, if the system is running low on virtual memory and there is insufficient hard drive space for saving the data, you can be alerted of the potential problem.

1-5 ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, hard disk drives and printers. This also includes consumer devices connected to the PC such as VCRs, TVs, telephones and stereos.

In addition to enabling operating system-directed power management, ACPI provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with both Windows 2000 and Windows NT 5.0.

Microsoft OnNow

The OnNow design initiative is a comprehensive, system-wide approach to system and device power control. OnNow is a term for a PC that is always on but appears to be off and responds immediately to user or other requests.

Slow Blinking LED for Suspend-State Indicator

When the CPU goes into a suspend state, the chassis power LED will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will wake-up and the LED will automatically stop blinking and remain on.

Main Switch Override Mechanism

When an ATX power supply is used, the power button can function as a system suspend button to make the system enter a SoftOff state. The monitor will be suspended and the hard drive will spin down. Depressing the power button again will cause the whole system to wake-up. During the SoftOff state, the ATX power supply provides power to keep the required circuitry in the system alive. In case the system malfunctions and you want to turn off the power, just depress and hold the power button for 4 seconds. This option can be set in the Power section of the BIOS Setup routine.

External Modem Ring-On

Wake-up events can be triggered by a device such as the external modem ringing when the system is in the SoftOff state. Note that external modem ring-on can only be used with an ATX 2.01 (or above) compliant power supply.

Wake-On-LAN (WOL)

Wake-On-LAN is defined as the ability of a management application to remotely power up a computer that is powered off. Remote PC setup, updates and asset tracking can occur after hours and on weekends so that daily LAN traffic is kept to a minimum and users are not interrupted. The motherboard has a 3-pin header (WOL) to connect to the 3-pin header on a

Network Interface Card (NIC) that has WOL capability. Wake-On-LAN must be enabled in BIOS. Note that Wake-On-LAN can only be used with an ATX 2.01 (or above) compliant power supply.

1-6 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates.

The X6DH8-G2/X6DHE-G2 can only accommodates 24-pin ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. You should use one that will supply at least 400W of power connector. In addition, the 12V 4-pin power supply (J32) - is also required to ensure adequate power supply to the system. Also your power supply must supply 1.5A for the Ethernet ports.

NOTE: The + 12V 8-pin Aux. Power Connector (J1D1) is also required to support Intel Xeon CPUs. Failure to provide this extra power will result in CPU PWR Failure. See Section 2-5 for details on connecting the power supply.

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant (info at <http://www.ssiforum.org/>). Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

1-7 Super I/O

The disk drive adapter functions of the Super I/O chip include a floppy disk drive controller that is compatible with industry standard 82077/765, a data separator, write pre-compensation circuitry, decode logic, data rate selection, a clock generator, drive interface control logic and interrupt and DMA logic. The wide range of functions integrated onto the Super I/O greatly reduces the number of components required for interfacing with floppy disk drives. The Super I/O supports 360 K, 720 K, 1.2 M, 1.44 M or 2.88 M disk drives and data transfer rates of 250 Kb/s, 500 Kb/s or 1 Mb/s. It also provides two high-speed, 16550 compatible serial communication ports (UARTs), one of which supports serial infrared communication. Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator,

complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

The Super I/O supports one PC-compatible printer port (SPP), Bi-directional Printer Port (BPP) , Enhanced Parallel Port (EPP) or Extended Capabilities Port (ECP).

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through an SMI or SCI function pin. It also features auto power management to reduce power consumption.

The IRQs, DMA_s and I/O space resources of the Super I/O can flexibly adjust to meet ISA PnP requirements, which support ACPI and APM (Advanced Power Management).

Chapter 2

Installation

2-1 Static-Sensitive Devices

Electric-Static-Discharge (ESD) can damage electronic components. To prevent damage to your system board, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the board from the anti-static bag.
- Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.
- Use only the correct type of onboard CMOS battery. Do not install the onboard upside down battery to avoid possible explosion.

Unpacking

The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

2-2 Nocona Processor and Heatsink Installation



When handling the processor package, avoid placing direct pressure on the label area of the fan. Also, do not place the motherboard on a conductive surface, which can damage the BIOS battery and prevent the system from booting up.

IMPORTANT: Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket **before** you install the CPU (CEK) heat sink. To adequately support the weight of CPU heat sinks, please install the X6DH8-G2/X6DHE-G2 in a chassis that is compliant with the SSI EEB 3.5 Specification.

CPU Installation

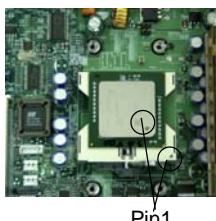
1. Lift the lever on the CPU socket:

lift the lever completely as shown on the picture on the right; otherwise, you will damage the CPU socket when power is applied. (Install CPU1 first.)



Socket lever

2. Insert the CPU in the socket, making sure that pin 1 of the CPU aligns with pin 1 of the socket (both corners are marked with a triangle). When using only one CPU, install it into CPU socket #1 (socket #2 is automatically disabled if only one CPU is used).



Pin1

3. Press the lever down until you hear the *click* so you can be sure that the CPU is securely installed in the CPU socket.



Socket lever in the locking Position

CEK Heatsink Installation

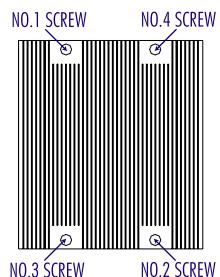
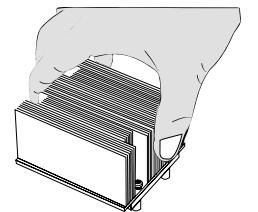
IMPORTANT: Due to the weight of the CEK Passive Heatsink (which weights about 1KG), you need to have Heatsink Mounting plate installed on the chassis to prevent damage to the CPU and the motherboard)

1. Do not apply any thermal compound to the heatsink or the CPU die-the required amount has already been applied.

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.

3. Screw in two diagonal screws (ie the #1 and the #2 screws) until just snug (-do not fully tighten the screws to avoid possible damage to the CPU.)

4. Finish the installation by fully tightening all four screws.



To Un-install the Heatsink

(Caution! We do not recommend that the CPU or the heatsink be removed. However, if you do need to un-install the heatsink, please follow the instructions below to uninstall the heatsink to prevent damage done to the CPU or the CPU socket.)

1. Unscrew and remove the heatsink screws from the motherboard in the sequence as show in the picture on the right.

2. Hold the heatsink as show in the picture on the right and gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!!)

3. Once the CPU is loosened, remove the heatsink from the CPU socket.

4. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease on the surface before you re-install the CPU and the heatsink.

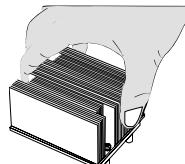
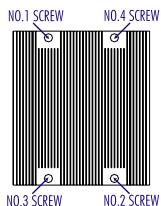


Figure 2-1. PGA604 Socket: Empty and with Processor Installed

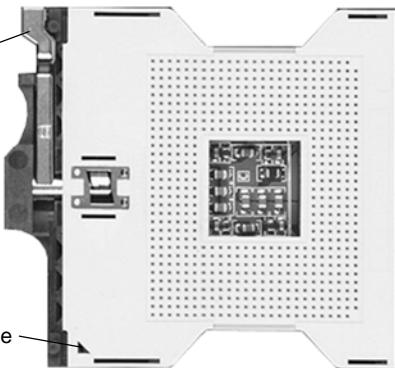


Warning! Make sure you lift the lever completely when installing the CPU. If the lever is only partly raised, damage to the socket or CPU may result.

Empty socket

Lever

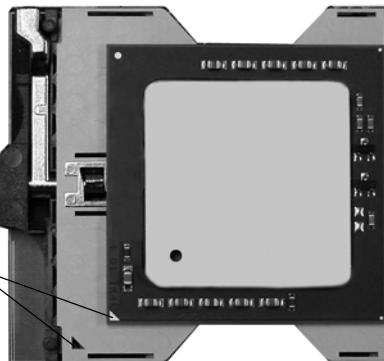
Triangle



Processor

(installed)

Triangle



Mounting the Motherboard in the Chassis

All motherboards have standard mounting holes to fit different types of chassis. Make sure the location of all the mounting holes for both the motherboard and the chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the motherboard to the chassis. Make sure the metal standoffs click in or are screwed in tightly. Then use a screwdriver to secure the motherboard onto the motherboard tray.

2-3 Installing DIMMs

Note: Check the Supermicro web site for recommended memory modules:
http://www.supermicro.com/TECHSUPPORT/FAQs/Memory_vendors.htm

CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Also note that the memory is interleaved to improve performance (see step 1).

DIMM Installation (See Figure 2-2)

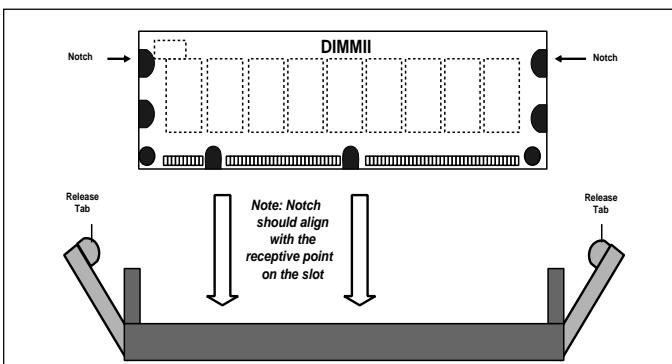
1. Insert the desired number of DIMMs into the memory slots, starting with Bank 1. The memory scheme is interleaved so you must install two modules at a time, beginning with Bank 1, then Bank 2, and so on.
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.
3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules (see step 1 above).

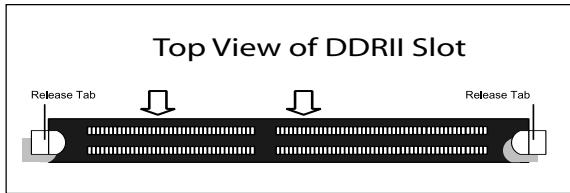
Memory Support

The X6DH8-G2/X6DHE-G2 supports up to 16 GB of Registered ECC DDR2-400 (PC3200) memory. All motherboards were designed to support 2 GB modules in each slot, but has only been verified for up to 1 GB modules.

Figure 2-2. Installing and Removing DIMMs

To Install:
Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.



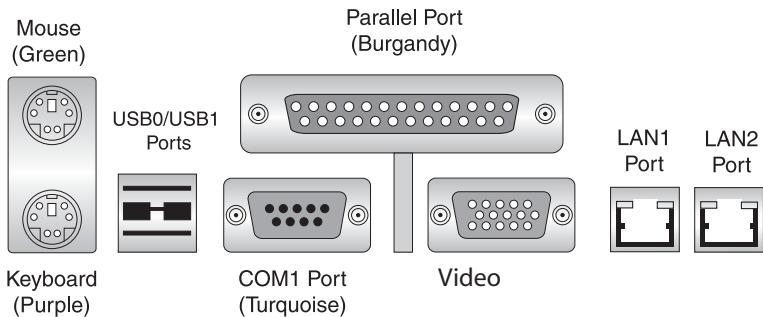
**To Remove:**

Use your thumbs to gently push near the edge of both ends of the module. This should release it from the slot.

2-4 I/O Ports/Control Panel Connectors

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 2-3 below for the colors and locations of the various I/O ports.

Figure 2-3. I/O Port Locations and Definitions



Front Control Panel

JF1 contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. These connectors are designed specifically for use with Supermicro server chassis. See Figure 2-4 for the descriptions of the various control panel buttons and LED indicators. Refer to the following section for descriptions and pin definitions.

Figure 2-4. JF1 Header Pins

	20	19	
Ground	{	{	
X	{	{	
Power LED	{	{	NMI
HDD LED	{	{	X
NIC1 LED	{	{	Vcc
NIC2 LED	{	{	Vcc
Overheat LED	{	{	Vcc
Power Fail LED	{	{	Vcc
Ground	{	{	Reset Button
Ground	{	{	Power Button
	2	1	

2-5 Connecting Cables

ATX Power Connector

The main power supply connector on the X6DH8-G2/X6DHE-G2 meets the SSI (Superset ATX) 24-pin specification. You must also connect the 4-pin (J32) power connector to your power supply. See the table on the right for pin definitions.

ATX Power Supply 24-pin Connector
Pin Definitions

Pin Number	Definition	Pin Number	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON#	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res(NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

+12V 4-pin
Connector
(J32)

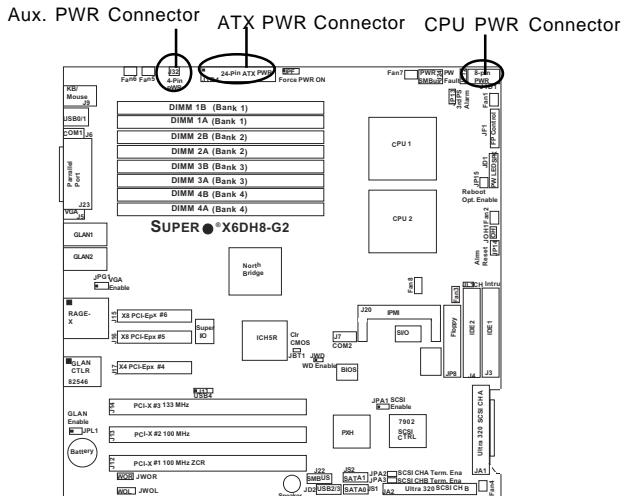
Pins #	Definition
1 & 2	Ground
3 & 4	+12 V

Processor Power Connector

In addition to the Primary ATX power connector (above), the 12v 8-pin Processor connector at J1D1 must also be connected to your power supply.

8-Pin +12v Power Supply
Connector (J1D1)

Pins	Definition
1 thru 4	Ground
5 thru 8	+12v



NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)

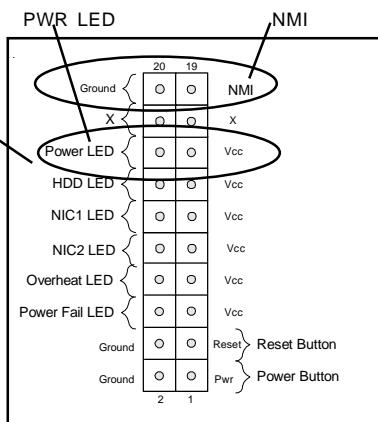
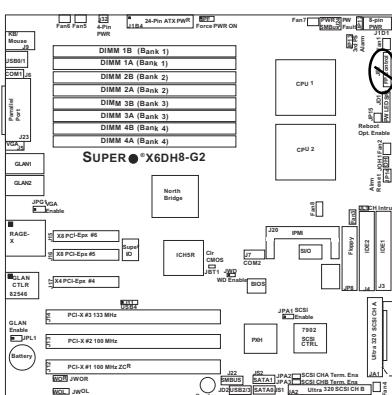
Pin Number	Definition
19	Control
20	Ground

Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

PWR_LED Pin Definitions (JF1)

Pin Number	Definition
15	Vcc
16	Control



HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach the hard drive LED cable here to display disk activity (for any hard drives on the system, including SCSI, Serial ATA and IDE). See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)

Pin Number	Definition
13	Vcc
14	HD Active

NIC1/NIC2 LED Indicators

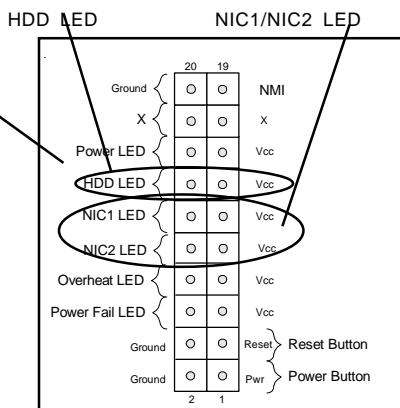
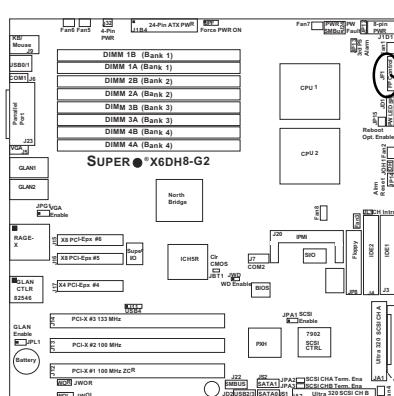
The NIC (Network Interface Controller) LED connections for the GLAN port1 is located on pins 11 and 12 of JF1, and for the GLAN port2 is located on pins 9 and 10 of JF1. Attach the NIC LED cables to display network activity. Refer to the tables on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)

Pin Number	Definition
11	Vcc
12	GND

NIC2 LED Pin Definitions (JF1)

Pin Number	Definition
9	Vcc
10	GND



Overheat LED (OH)

Connect an LED to the OH connection on pins 7 and 8 of JF1 to provide advanced warning of chassis overheating. Refer to the table on the right for pin definitions.

Overheat (OH) LED Pin Definitions (JF1)

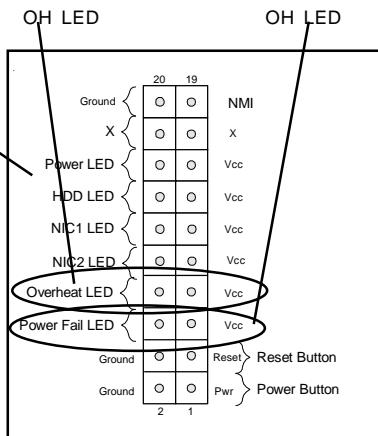
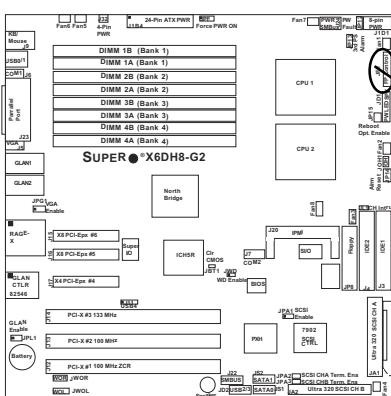
Pin Number	Definition
7	Vcc
8	Control Signal

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

Overheat (OH) LED Pin Definitions (-IE1)

Pin Number	Definition
5	Vcc
6	Control Signal



Reset Button

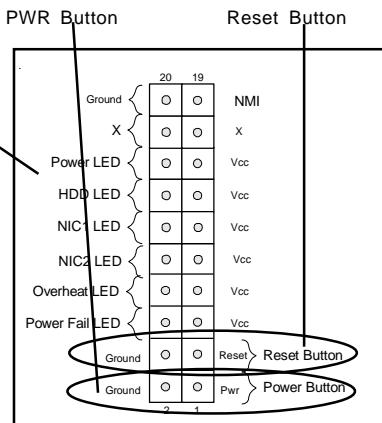
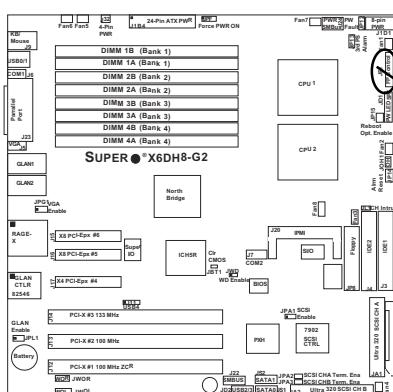
The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

Reset Pin Definitions (JF1)	
Pin Number	Definition
3	Reset
4	Ground

Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system.

Power Button Connector Pin Definitions (JF1)	
Pin Number	Definition
1	PW_ON
2	Ground



Chassis Intrusion

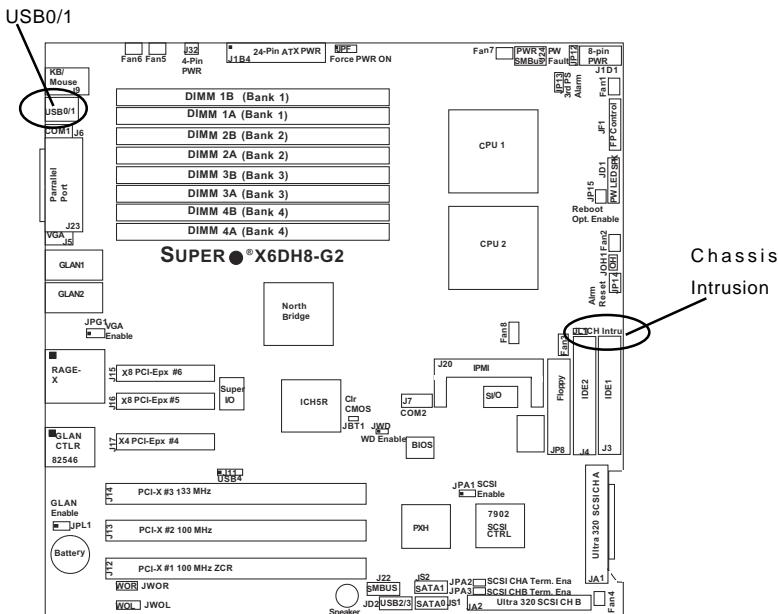
A Chassis Intrusion header is located at JL1. Attach the appropriate cable to inform you of a chassis intrusion.

Universal Serial Bus (USB0/1)

Two USB 2.0 ports are located beside the PS/2 keyboard/mouse ports. USB0 is the bottom connector and USB1 is the top connector. See the table on the right for pin definitions.

Universal Serial Bus Pin Definitions USB0/1

Pin Number	Definition
1	Vcc
2	Data-
3	Data+
4	Ground



Front Panel Universal Serial Bus Headers

Extra USB headers (FPUSB2/FPUSB3/FPUSB4) can be used for front side USB access. You will need a USB cable to use either connection. Refer to the tables on the right for pin definitions.

Front Panel Universal Serial Bus Pin Definitions

FPUSB2/FPUSB3			
Pin Number	Definition	Pin Number	Definition
1	Vcc	2	Vcc
3	Data-	4	Data-
5	Data+	6	Data+
7	Ground	8	Ground
9	Key	10	NA

Universal Serial Bus Pin Definitions FP USB4

Pin Number	Definition
1	Vcc
2	Data-
3	Data+
4	Ground
5	NA

Serial Ports

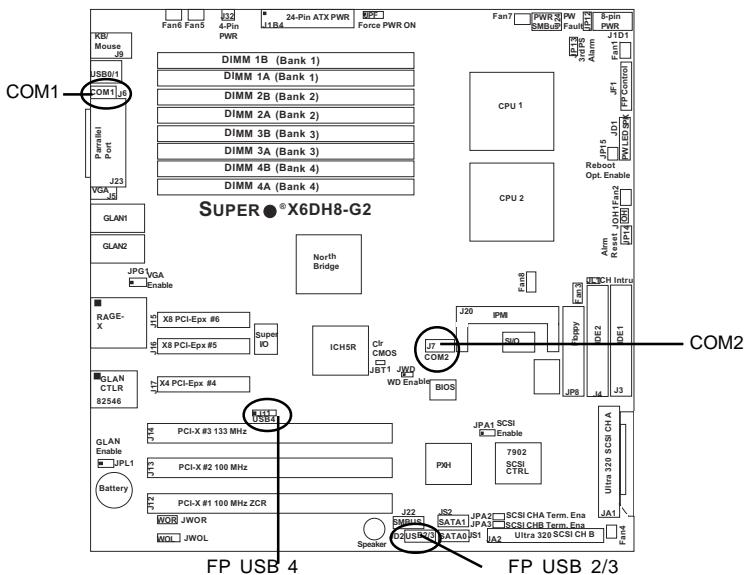
The COM1 (J6) and COM2 (J7) serial ports are located under the parallel port (COM1) and next to IPMI (COM2). See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1)

Pin Number	Definition	Pin Number	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		

Serial Port Pin Definitions (COM2)

Pin Number	Definition	Pin Number	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND	10	NC



GLAN (Giga-bit Ethernet Ports)



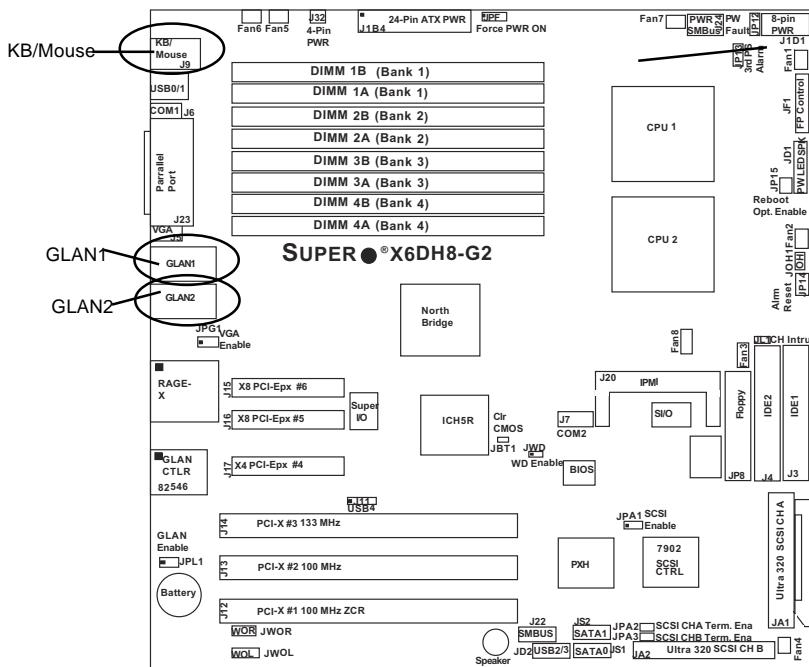
Two G-bit Ethernet ports are located beside the COM2 port on the IO backplane. This port accepts RJ45 type cables.

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and PS/2 mouse are located on J9. See the table at right for pin definitions. (See Figure 2-3 for the locations of each.)

PS/2 Keyboard and Mouse Port Pin Definitions (J9)

Pin Number	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC



Fan Headers

The X6DH8-G2/X6DHE-G2 has eight fan headers (Fan1 to Fan8). Fan1-Fan4 are 3-pin fans, and Fan5-Fan8 are 4-pin fans. (* Note: Fan5-Fan8 are 4-pin fan headers; however, Pins 1-3 of these fan headers are backward compatible with the traditional 3-pin fans.) See the table on the right for pin definitions. (The onboard fan speed is controlled by Thermal Management via BIOS. To activate Fan Speed Control, please refer to "Hardware Monitoring" in the Advanced Setting.)

Power LED/Speaker

On the JDI header, pins 1-3 are for a power LED and pins 4-7 are for the speaker. See the table on the right for speaker pin definitions. Note: The speaker connector pins are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

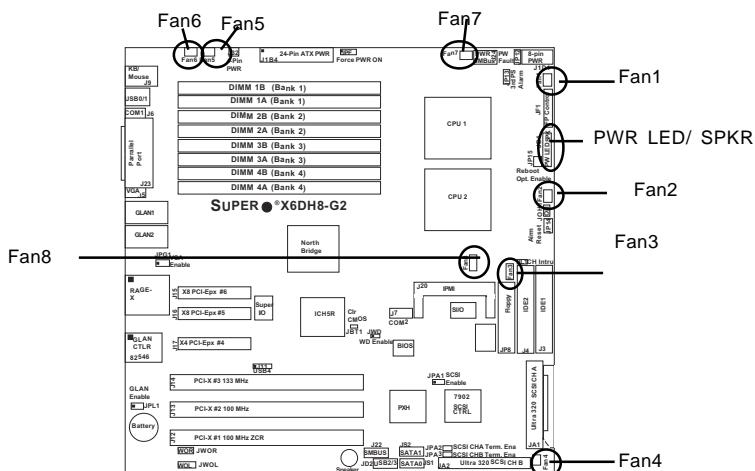
4-pin Fan Header Pin Definitions

Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	PWM Control

Caution: These fan headers use DC power.

Speaker Connector Pin Definitions (JD1)

Pin Number	Function	Definition
4	+	Power
5	Key	No connection
6		Key
7		Speaker data



Wake-On-Ring

The Wake-On-Ring header is designated JWOR. This function allows your computer to receive and "wake-up" by an incoming call to the modem when in suspend state. See the table on the right for pin definitions. You must have a Wake-On-Ring card and cable to use this feature.

Wake-on-Ring Pin Definitions (JWOR)

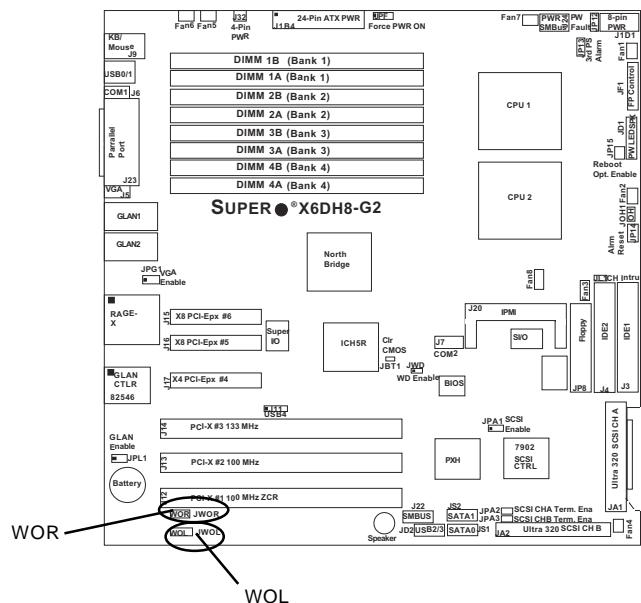
Pin Number	Definition
1	Ground
2	Wake-up

Wake-On-LAN

The Wake-On-LAN header is designated WOL. See the table on the right for pin definitions. You must enable the LAN Wake-Up setting in BIOS to use this feature. You must also have a LAN card with a Wake-on-LAN connector and cable.

Wake-On-LAN Pin Definitions (JW01)

Pin Number	Definition
1	+5V Standby
2	Ground
3	Wake-up



SMB

A System Management Bus header is located at J22. Connect the appropriate cable here to utilize SMB on your system.

Fan Header Pin Definitions (J22)

Pin Number	Definition
1	Data
2	GND
3	CLK
4	NC

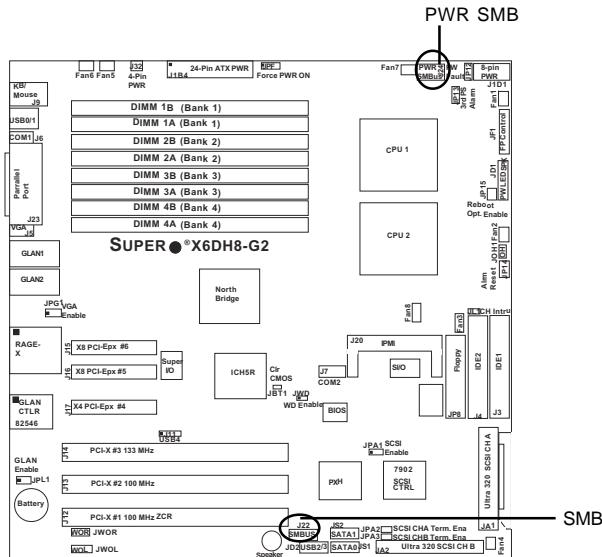
Caution: These fan headers are DC power.

SMB Power (I²C) Connector

I²C Connector (J24), located between the PWR ForceOn Header and the PWR Fault header, monitors the status of PWR Supply, Fan and system temperature.

SMB PWR Pin Definitions (J24)

Pin #	Definition
1	Clock
2	Data
3	N/A
4	N/A
5	N/A

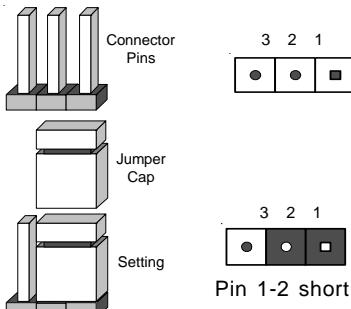


2-6 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.

Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.



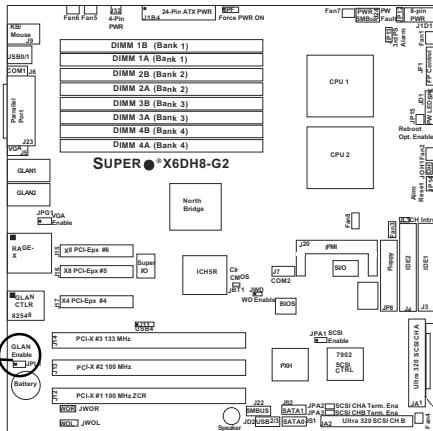
GLAN Enable/Disable

JPL1 enables or disables the GLAN port(s) on the motherboard. See the table on the right for jumper settings. The default setting is enabled.

GLAN
Enable/Disable
Jumper Settings
(JPL1)

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

GLAN
Enable



CMOS Clear

JBT1 is used to clear CMOS. Instead of pins, this "jumper" consists of contact pads to prevent the accidental clearing of CMOS. To clear CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection. Always remove the AC power cord from the system before clearing CMOS.

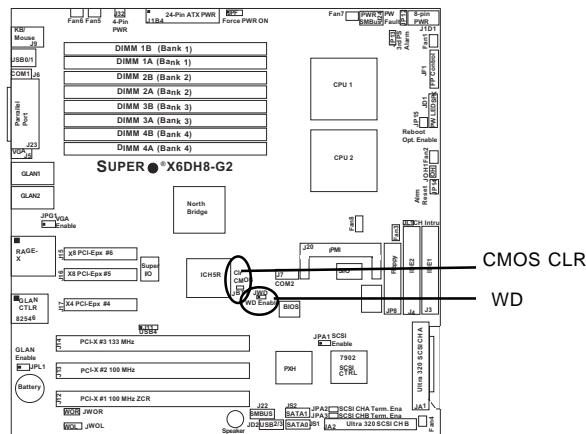
Note: For an ATX power supply, you must completely shut down the system, remove the AC power cord and then short JBT1 to clear CMOS. **Do not use the PW ON connector to clear CMOS.**

Watch Dog

JWD controls Watch Dog, a system monitor that takes action when a software application freezes the system. Pins 1-2 will have WD reset the system if a program freezes. Pins 2-3 will generate a non-maskable interrupt for the program that has frozen (requires software implementation). Watch Dog must also be enabled in BIOS.

Watch Dog
Jumper Settings (JWD)

Jumper Position	Definition
Pins 1-2	WD to Reset
Pins 2-3 Open	WD to NMI Disabled



VGA Enable/Disable

JPG1 enables or disables the VGA Connector on the motherboard. See the table on the right for jumper settings. The default setting is enabled.

VGA
Enable/Disable
Jumper Settings
(JPG1)

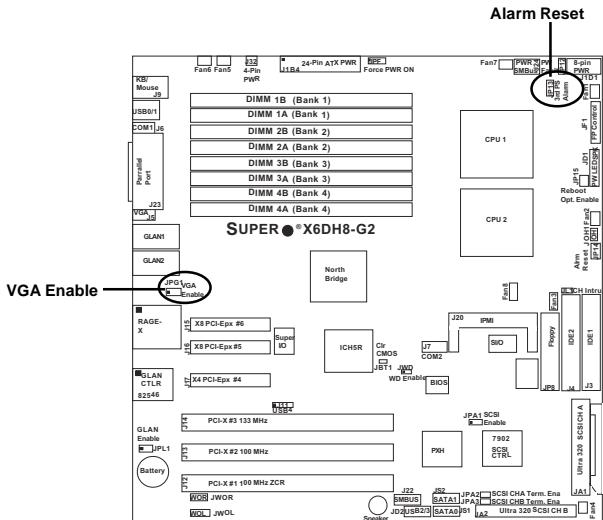
Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Alarm Reset

The system will notify you in the event of a power supply failure. This feature assumes that Supermicro redundant power supply units are installed in the chassis. If you only have a single power supply installed, please do not connect anything to this header to prevent false alarms. See the table on the right for jumper settings.

Alarm Reset Jumper
Settings
(JP14)

Jumper Position	Definition
Open	Normal
Closed	Reset Alarm

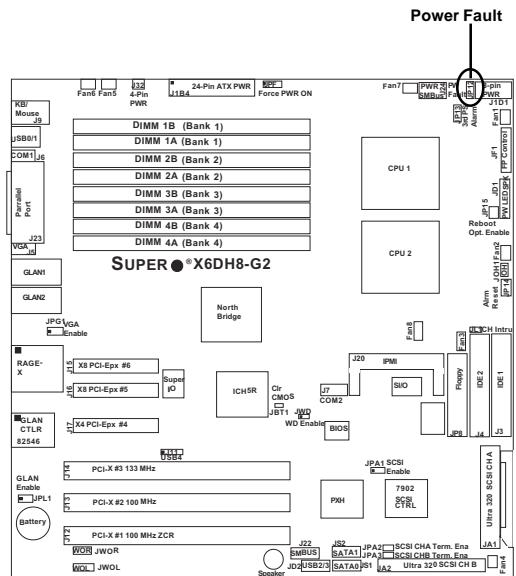


Power Fault

Connect a cable from your power supply to JP12 to provide warning of power supply failure. This warning signal is passed through the PWR_LED pin to indicate of a power failure on the chassis. See the table on the right for pin definitions.

Alarm Reset Jumper Settings (JP12)

Jumper Position	Definition
1	PWR#1
2	PWR#2
3	PWR#3
4	Signal: Alarm Reset



SCSI Enable/Disable (*For X6DH8 only)

Jumper JPA1 allows you to enable or disable the SCSI headers. Jumper JPA1 is for headers #1 and #2. The default setting is pins 1-2 to enable all four headers. See the table on the right for jumper settings.

**SCSI Enable/Disable
Jumper Settings
(JPA1)**

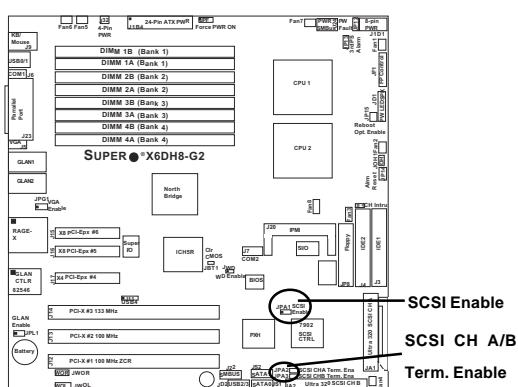
Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

SCSI CH A/B Termination Enable/Disable (*For X6DH8 only)

Jumpers JPA2 and JPA3 allow you to enable or disable termination for the SCSI connectors. Jumper JPA2 controls SCSI channel A and JPA3 is for SCSI channel B. The default setting is open to enable (terminate) both SCSI channels. **(*Note: the manufacturer default setting is "Open". For SCSI to function properly, please do not change the default setting.)** See the table on the right for jumper settings.

**SCSI Channel Termination
Enable/Disable
Jumper Settings
(JPA2, JPA3)**

Jumper Position	Definition
Open	Enabled
Closed	Disabled



2-7 Onboard Indicators

GLAN LEDs

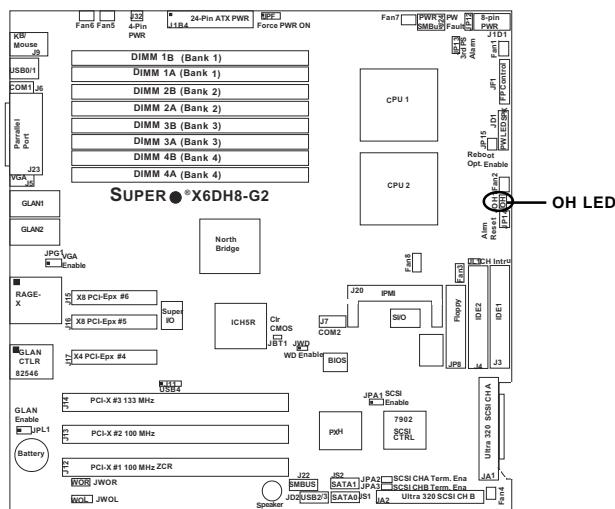
The Gigabit Ethernet LAN port (located beside the COM2 port) has two LEDs. The yellow LED indicates activity while the other LED may be green, orange or off to indicate the speed of the connection. See the table at right for the functions associated with the second LED.

G-bit LAN Right LED Indicator	
LED Color	Definition
Off	No Connection
Green	100 MHz
Orange	1 GHz

Overheat LED (JOH1)

Connect an LED to the JOH header to provide warning of chassis overheating. See the table on the right for pin definitions.

Overheat LED Pin Definitions (JOH1)	
Pin Number	Definition
1	+5V
2	OH Active



2-8 Parallel Port, Floppy/Hard Disk Drive and SCSI Connections

Note the following when connecting the floppy and hard disk drive cables:

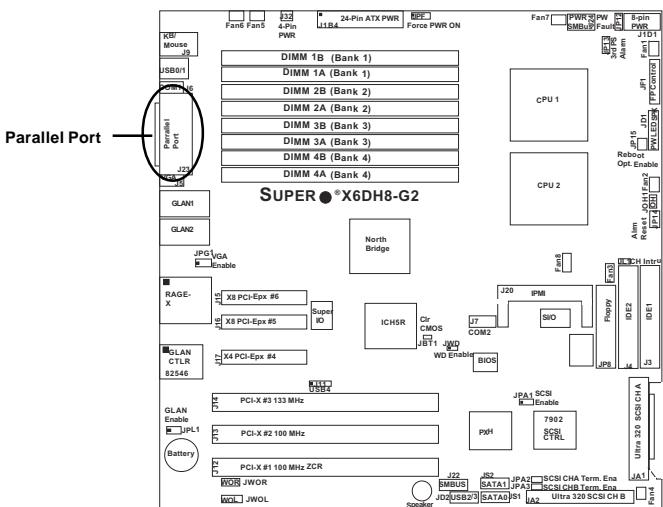
- The floppy disk drive cable has seven twisted wires.
- A red mark on a wire typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

Parallel (Printer) Port Connector

The parallel (printer) port is located on J23. See the table on the right for pin definitions.

Parallel (Printer) Port Pin Definitions
(J23)

Pin Number	Function	Pin Number	Function
1	Strobe-	2	Auto Feed-
3	Data Bit 0	4	Error-
5	Data Bit 1	6	Init-
7	Data Bit 2	8	SLCT IN-
9	Data Bit 3	10	GND
11	Data Bit 4	12	GND
13	Data Bit 5	14	GND
15	Data Bit 6	16	GND
17	Data Bit 7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT		



Floppy Connector

The floppy connector is located on JP8. See the table below for pin definitions.

Floppy Connector Pin Definitions (JP8)

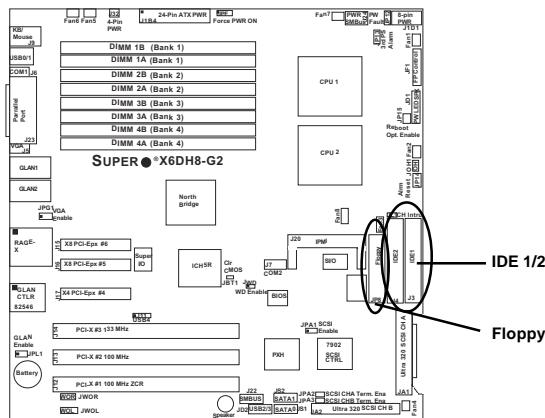
Pin Number	Function	Pin Number	Function
1	GND	2	FDHDIN
3	GND	4	Reserved
5	Key	6	FDDEDIN
7	GND	8	Index-
9	GND	10	Motor Enable
11	GND	12	Drive Select B
13	GND	14	Drive Select A
15	GND	16	Motor Enable
17	GND	18	DIR-
19	GND	20	STEP-
21	GND	22	Write Data
23	GND	24	Write Gate
25	GND	26	Track 00-
27	GND	28	Write Protect
29	NC	30	Read Data
31	GND	32	Side 1 Select
33	NC	34	Diskette

IDE Connectors

There are no jumpers to configure the onboard IDE#1 and #2 connectors (at J3 and J4, respectively). See the table on the right for pin definitions.

IDE Connector Pin Definitions (J3, J4)

Pin Number	Function	Pin Number	Function
1	Reset IDE	2	GND
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	GND	20	Key
21	DRQ3	22	GND
23	I/O Write	24	GND
25	I/O Read	26	GND
27	IOCRDY	28	BALE
29	DACK3	30	GND
31	IRQ14	32	NC
33	Addr 1	34	GND
35	Addr 0	36	Addr 2
37	Chip Select 0	38	Chip Select 1
39	Activity	40	GND



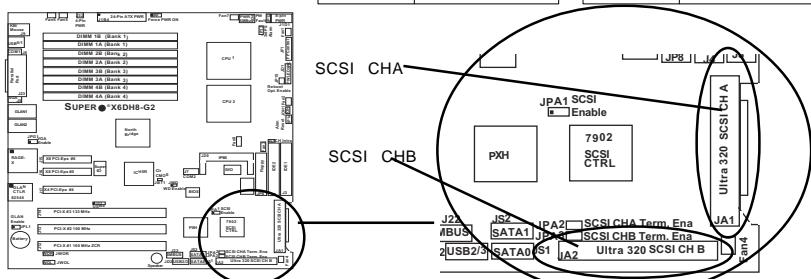
Ultra320 SCSI Connectors

(*X6DH8-G2 Only)

Refer to the table below for the pin definitions of the Ultra320 SCSI connectors located at JA1 and JA2.

68-pin Ultra320 SCSI Connectors (JA1 and JA2)

Connector Contact Number	Signal Names	Connector Contact Number	Signal Names
1	+DB(12)	35	-DB(12)
2	+DB(13)	36	-DB(13)
3	+DB(14)	37	-DB(14)
4	+DB(15)	38	-DB(15)
5	+DB(P1)	39	-DB(P1)
6	+DB(0)	40	-DB(0)
7	+DB(1)	41	-DB(1)
8	+DB(2)	42	-DB(2)
9	+DB(3)	43	-DB(3)
10	+DB(4)	44	-DB(4)
11	+DB(5)	45	-DB(5)
12	+DB(6)	46	-DB(6)
13	+DB(7)	47	-DB(7)
14	+DB(P)	48	-DB(P)
15	GROUND	49	GROUND
16	DIFFSENS	50	GROUND
17	TERMPWR	51	TERMPWR
18	TERMPWR	52	TERMPWR
19	RESERVED	53	RESERVED
20	GROUND	54	GROUND
21	+ATN	55	-ATN
22	GROUND	56	GROUND
23	+BSY	57	-BSY
24	+ACK	58	-ACK
25	+RST	59	-RST
26	+MSG	60	-MSG
27	+SEL	61	-SEL
28	+C/D	62	-C/D
29	+REQ	63	-REQ
30	+I/O	64	-I/O
31	+DB(8)	65	-DB(8)
32	+DB(9)	66	-DB(9)
33	+DB(10)	67	-DB(10)
34	+DB(11)	68	-DB(11)



(*Note: Please refer to Appendix B for software and OS installation. For Adaptec's SCSI SATA HostRAID, please refer to the CD that came with your motherboard.)

Chapter 3

Troubleshooting

3-1 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the 'Technical Support Procedures' and/or 'Returning Merchandise for Service' section(s) in this chapter.

Note: Always disconnect the power cord before adding, changing or installing any hardware components.

Before Power On

1. Make sure no short circuits exist between the motherboard and chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
3. Remove all add-on cards.
4. Install one CPU (making sure it is fully seated) and connect the chassis speaker and the power LED to the motherboard. (Check all jumper settings as well.)
5. Use only the correct type of CMOS onboard battery as recommended by the Manufacturer. Do not install the onboard battery upside down to avoid possible explosion.

No Power

1. Make sure no short circuits exist between the motherboard and the chassis.
2. Verify that all jumpers are set to their default positions.
3. Check that the 115V/230V switch on the power supply is properly set.
4. Turn the power switch on and off to test the system.
5. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

No Video

1. If the power is on but you have no video, remove all the add-on cards and cables.
2. Use the speaker to determine if any beep codes exist. Refer to the Appendix for details on beep codes.

NOTE

If you are a system integrator, VAR or OEM, a POST diagnostics card is recommended. For I/O port 80h codes, refer to App. B.

Memory Errors

1. Make sure the DIMM modules are properly and fully installed.
2. Determine if different speeds of DIMMs have been installed and verify that the BIOS setup is configured for the fastest speed of RAM used. It is recommended to use the same RAM speed for all DIMMs in the system.
3. Make sure you are using the correct type of Registered ECC DDR2-400 (PC3200) SDRAM (*recommended by the manufacturer.)
4. Check for bad DIMM modules or slots by swapping a single module between two slots and noting the results.
5. Make sure all memory modules are fully seated in their slots. As an interleaved memory scheme is used, you must install two modules at a time, beginning with Bank 1, then Bank 2, and so on (see Section 2-3).
6. Check the position of the 115V/230V switch on the power supply.

Losing the System's Setup Configuration

1. Ensure that you are using a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information. Refer to Section 1-6 for details on recommended power supplies.
2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.
3. If the above steps do not fix the Setup Configuration problem, contact your vendor for repairs.

3-2 Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, note that as a motherboard manufacturer, Super Micro does not sell directly to end-users, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problem(s) with the specific system configuration that was sold to you.

1. Please go through the 'Troubleshooting Procedures' and 'Frequently Asked Question' (FAQ) sections in this chapter or see the FAQs on our web site (<http://www.supermicro.com/TECHSUPPORT/techsupport.htm>) before contacting Technical Support.
2. BIOS upgrades can be downloaded from our web site at <http://www.supermicro.com/techsupport/download.htm>.

Note: Not all BIOS can be flashed depending on the modifications to the boot block code.

3. If you still cannot resolve the problem, include the following information when contacting Super Micro for technical support:
 - Motherboard model and PCB revision number
 - BIOS release date/version (this can be seen on the initial display when your system first boots up)
 - System configurationAn example of a Technical Support form is on our web site at http://www.supermicro.com/techsupport/contact_support.htm.
4. Distributors: For immediate assistance, please have your account number ready when placing a call to our technical support department. We can be reached by e-mail at support@supermicro.com or by fax at: (408) 503-8000, option 2.

3-3 Frequently Asked Questions

Question: What are the various types of memory that my motherboard can support?

Answer: The X6DH8-G2/X6DHE-G2 has eight 240-pin DIMM slots that support registered ECC DDR2-400 (PC3200) SDRAM modules. It is strongly recommended that you do not mix memory modules of different speeds and sizes.

Question: How do I update my BIOS?

Answer: It is recommended that you do not upgrade your BIOS if you are experiencing no problems with your system. Updated BIOS files are located on our web site at <http://www.supermicro.com>. Please check our BIOS warning message and the info on how to update your BIOS on our web site. Also, check the current BIOS revision and make sure it is newer than your BIOS before downloading. Select your motherboard model and down-

load the BIOS file to your computer. Unzip the BIOS update file and you will find the readme.txt (flash instructions), the phlash.exe (BIOS flash utility), the platform.bin (platform file) and the BIOS image (xxxxxx.rom) files. Copy these files onto a bootable floppy and reboot your system. Follow the Readme.txt to continue flashing the BIOS.

Question: What's on the CD that came with my motherboard?

Answer: The supplied compact disc has quite a few drivers and programs that will greatly enhance your system. We recommend that you review the CD and install the applications you need. Applications on the CD include chipset drivers for Windows and security and audio drivers.

3-4 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alternation, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.